Twister® Micro XD

Recommended Cutting Data MPDCS / MXDSR / MXDCR / MXDCL Series - Inch

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc-SFM	Drill Diameter (mm) 0.5	1.0	1.5	2.0	2.5	2.95
							f - IPR					
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	MXDSR		5	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	300	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12	260		.0007	.0010	.0013	.0017	.0020
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	MXDSR		5	130	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	300	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12	260		.0007	.0010	.0013	.0017	.0020
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	MXDSR		5	120	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	250	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12	230		.0007	.0010	.0013	.0017	.0020
Hardened Steels A2 / 52100	H	45 to 55 Rc	MXDSR		5	50	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2	80	—	.0004	.0007	.0009	.0011	.0014
			MXDCR		5							
			MXDCL		12			.0002	.0004	.0006	.0008	.0010
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	MXDSR		5	140	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	300	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12	260		.0007	.0010	.0013	.0017	.0020
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	MXDSR		5	125	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	230	—	.0008	.0012	.0016	.0020	.0023
			MXDCR		5							
			MXDCL		12			.0007	.0010	.0013	.0017	.0020
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	MXDSR		5	60	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2	80	—	.0004	.0007	.0009	.0011	.0014
			MXDCR		5							
			MXDCL		12			.0002	.0004	.0006	.0008	.0010

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

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Twister® Micro XD

Recommended Cutting Data MPDCS / MXDSR / MXDCR / MXDCL Series - Inch (*continued*)

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc-SFM	Drill Diameter (mm) 0.5	1.0	1.5	2.0	2.5	2.95
							f - IPR					
Cast Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	MXDSR		5	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2		—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5	325						
			MXDCL		12							
Cast Iron - Ductile & Malleable CGI: 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	MXDSR		5	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2		—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5	250						
			MXDCL		12							
Titanium 6Al-4V	S	up to 40 Rc	MXDSR		5	70	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2		—	.0004	.0006	.0008	.0010	.0012
			MXDCR		5	230						
			MXDCL		12							
High Temp Alloys Inconel / Hastelloy / Waspeloy / Nickel Based Alloys - Monel	S	up to 40 Rc	MXDSR		5	60	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2		—	.0004	.0006	.0008	.0010	.0012
			MXDCR		5	155						
			MXDCL		12							

Recommended Peck Depths for MXDSR (Solid) Drilling

Diameter	Peck Depth
0.50 mm	.2 x Diameter
1.00 mm	.3 x Diameter
1.50 mm	.6 x Diameter
2.00 mm	.8 x Diameter
2.50 mm	1.0 x Diameter
2.95 mm	3.0 x Diameter

*Peck depths can vary by material type.

Recommended Machine Requirements

High Pressure Pump System (1,000 psi / 68.9 bar)
Coolant filtration of 10 microns or better
Total runout of .0004" (.01 mm) Max. at drill tip

For best MXDCL performance, the following steps are recommended:

- When Drilling with the MXDCL, drill a pilot hole 1.5 - 2 x diameter deep using a MPDCS drill.
- Insert MXDCL into pilot hole at a low speed (300-500 RPM) stopping short of the pilot hole bottom.
- Start coolant flow and increase speed to recommended RPM.
- Feed to full depth. (Pecking may be required for standard coolant pressure. Follow the MXDSR peck depth chart. To prevent drill whip and corner damage, do not retract all the way out of hole while pecking.)
- After reaching desired depth, reduce speed (300-500 RPM) before retracting from the hole at a feed of 2-4 times the drilling feed.

Note: Under optimal conditions (high pressure coolant), one shot drilling may be accomplished with the MXDCL.

Twister® Micro XD

Recommended Cutting Data MPDCS / MXDSR / MXDCR / MXDCL Series - Metric

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc- m/min.	Drill Diameter (mm)					
							0.5	1.0	1.5	2.0	2.5	2.95
							f - mm/Rev					
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	MXDSR		5	45	.013	.025	.038	.051	.064	.076
			MPDCS		2	90	—	.025	.038	.051	.064	.076
			MXDCR		5							
			MXDCL		12	80		.017	.026	.034	.043	.050
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	MXDSR		5	40	.013	.025	.038	.051	.064	.076
			MPDCS		2	90	—	.025	.038	.051	.064	.076
			MXDCR		5							
			MXDCL		12	80		.017	.026	.034	.043	.050
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	MXDSR		5	35	.013	.025	.038	.051	.064	.076
			MPDCS		2	75	—	.025	.038	.051	.064	.076
			MXDCR		5							
			MXDCL		12	70		.017	.026	.034	.043	.050
Hardened Steels A2 / 52100	H	45 to 55 Rc	MXDSR		5	15	.005	.010	.018	.023	.028	.036
			MPDCS		2	25	—	.010	.018	.023	.028	.036
			MXDCR		5							
			MXDCL		12			.005	.010	.015	.020	.025
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	MXDSR		5	40	.013	.025	.038	.051	.064	.076
			MPDCS		2	90	—	.025	.038	.051	.064	.076
			MXDCR		5							
			MXDCL		12	80		.017	.026	.034	.043	.050
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	MXDSR		5	38	.013	.025	.038	.051	.064	.076
			MPDCS		2	70	—	.020	.030	.040	.050	.059
			MXDCR		5							
			MXDCL		12			.017	.026	.034	.043	.050
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	MXDSR		5	18	.005	.010	.018	.023	.028	.036
			MPDCS		2	25	—	.010	.018	.023	.028	.036
			MXDCR		5							
			MXDCL		12			.005	.010	.015	.020	.025

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

Twister® Micro XD

Recommended Cutting Data MPDCS / MXDSR / MXDCR / MXDCL Series - Metric (*continued*)

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc-SFM	Drill Diameter (mm) 0.5	1.0	1.5	2.0	2.5	2.95
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Cast Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	MXDSR		5	45	.013	.025	.038	.051	.064	.076
			MPDCS		2	100	—	.025	.038	.051	.064	.076
			MXDCR		5							
			MXDCL		12							
Cast Iron - Ductile & Malleable CGI: 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	MXDSR		5	45	.013	.025	.038	.051	.064	.076
			MPDCS		2	75	—	.025	.038	.051	.064	.076
			MXDCR		5							
			MXDCL		12							
Titanium 6Al-4V	S	up to 40 Rc	MXDSR		5	20	.013	.025	.038	.051	.064	.076
			MPDCS		2	70	—	.010	.015	.020	.025	.030
			MXDCR		5							
			MXDCL		12							
High Temp Alloys Inconel / Hastelloy / Waspeloy / Nickel Based Alloys - Monel	S	up to 40 Rc	MXDSR		5	18	.005	.010	.018	.023	.028	.036
			MPDCS		2	47	—	.010	.015	.020	.025	.030
			MXDCR		5							
			MXDCL		12							

Recommended Peck Depths For MXDSR Solid Drilling by Diameter*

Diameter	Peck Depth
0.50 mm	.2 x Diameter
1.00 mm	.3 x Diameter
1.50 mm	.6 x Diameter
2.00 mm	.8 x Diameter
2.50 mm	1.0 x Diameter
2.95 mm	3.0 x Diameter

*Peck depths can vary by material type.

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- Start coolant flow and increase speed to recommended RPM.
- Feed to full depth. (Pecking may be required for standard coolant pressure. Follow the MXDSR peck depth chart. To prevent drill whip and corner damage, do not retract all the way out of hole while pecking.)
- After reaching desired depth, reduce speed (300-500 RPM) before retracting from the hole at a feed of 2-4 times the drilling feed.

Note: Under optimal conditions (high pressure coolant), one shot drilling may be accomplished with the MXDCL

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